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1931

MICROSCOPE ILLUMINATORS

PATENT OFFICE
APR 27 1931
DIV. 55

Bausch & Lomb Optical Co.

New York Boston San Francisco Los Angeles
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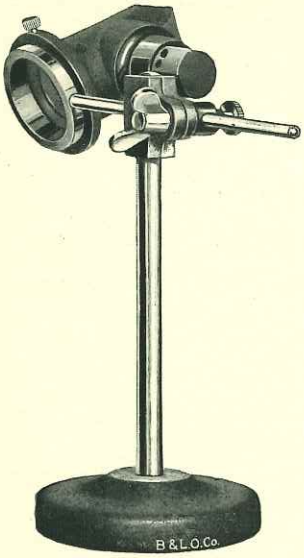
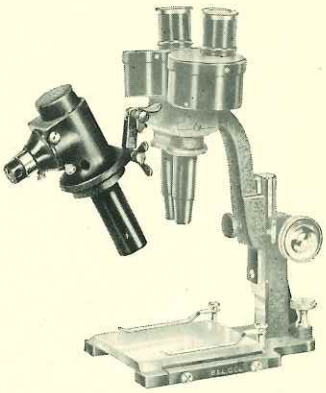
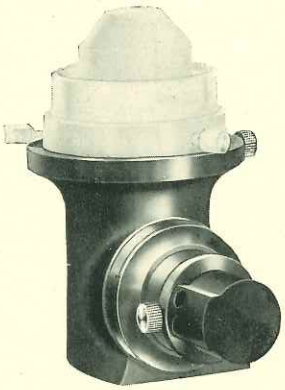


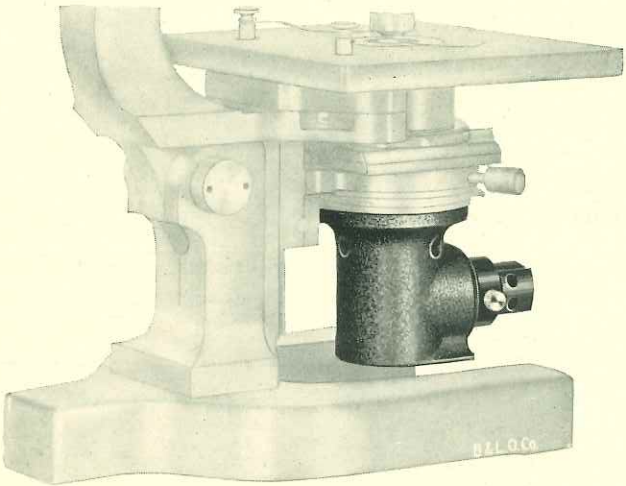
No. 1844-E Convertible Lamp on Lamp Support



Nicholas Illuminator with Microscope KW



No. 1844-A Convertible Lamp with No. 1747 Paraboloid Condenser



No. 1844-D Convertible Lamp on Complete Substage

Convertible Substage Lamp

THE B & L Convertible Substage Lamp is so designed that it may be used in several ways for different forms of microscopic illumination—particularly for bright field work with the Abbe Condenser, for dark field microscopy with the Paraboloid Condenser, and for vertical illumination with the Vertical Illuminator.

Used for:
1. *Bright Field Illumination (with or without Abbe Condenser)*
2. *Dark Field Illumination (with Paraboloid Condenser)*
3. *Oblique Illumination (with support No. 1767)*
4. *Photomicrography (with low power objectives)*
5. *Vertical Illumination (attached to vertical illuminator)*
6. *Drawing and Projection.*

The light source is a small, powerful, low voltage, Eveready Mazda bulb of the V type. When the light rays emerge from the condensing lens in the top of the lamp body, they are parallel and of uniform intensity. Should the intensity be too strong, a blue glass disc, frosted on one side, may be inserted in the ring on the lower mounting of the condenser. A disc is supplied with each lamp.

The lamp filament may be centered by moving the socket slightly in or out of the holder. A set screw releases it or holds it in place.

Current can be drawn from any lamp socket provided a suitable resistance is used. The lamp is finished in alcohol-proof black, and is supplied in a case.

Convertible Substage Lamp No. 1844-D, when used with B & L Abbe Condenser No. 1740, provides an excellent means for examining transparent objects effectively. It is an invaluable asset in high grade bright field work, especially when using oil immersion objectives on a B & L Binocular Microscope of the monobjective type. This combination can also be used very effectively for photomicrography (with objectives of 32, 16, 8 or 4 mm focus), and for short range projection work (up to 24 inches).

Convertible Substage Lamp No. 1844-A, in combination with B & L Paraboloid Condenser No. 1747, illuminates objects that are invisible with ordinary methods of lighting. Unstained and living micro-organisms can be quickly and reliably examined by this means.

When used with B & L Vertical Illuminator No. 1789-S, Convertible Substage Lamp No. 4602 is of great value in metallurgical examinations, as it remains in alignment with the vertical illuminator even when the microscope is being focused. The light source is easily centered with the condensing system, and, once secured in place, needs no further attention.

Convertible Substage Lamp No. 1844-E is mounted on Lamp Support No. 1767. With this combination the light may be directed on the stage at any desired angle from any desired distance. This is particularly ad-

vantageous when examining large, opaque objects with a Greenough type binocular microscope This lamp (with support) is recommended for oblique illumination when 48, 32, or 16 mm objectives are used on monocular microscopes, or 55, 48, 32, or 24 mm objectives on binocular instruments.

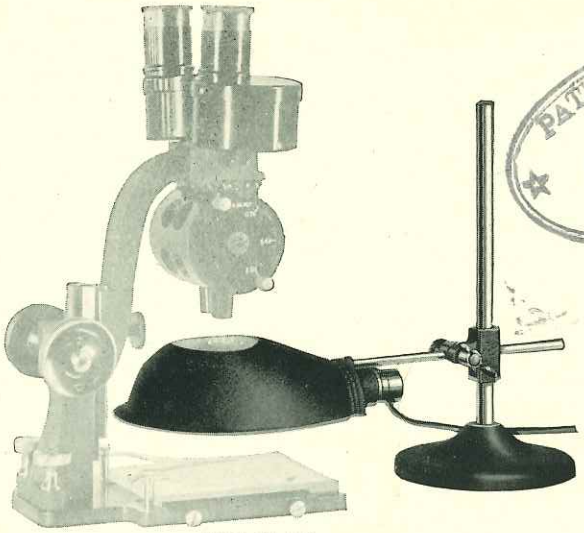
The Convertible Substage Lamp furnishes ample illumination for drawing and low power projection when used with a drawing mirror and substage condenser on microscopes using 32, 16, or 8 mm objectives.

The Nicholas* Illuminator is equipped with a condenser system to produce a parallel beam of light on the stage of the KW Microscope. A bracket with two joints allows for tilting the lamp to the desired angle for centering upon the field of view.

Code Word	Cat. No.	Specifications	Price
Acvic	1844-A	*Convertible Lamp*, with 6-volt, 15-cp., Mazda bulb, adapter for dark field illuminator, blue glass, dark field slide, and two cover glasses in case	$13.00
Acwug	1844-B	Same as 1844-A, but with adapter for Complete Substage instead of for Dark Ground Illuminator; without slide or cover glass	12.50
Acyad	1844-D	*Convertible Lamp* and 6-v 15-cp. Mazda bulb, with frosted blue glass; in case. (For use with Abbe condenser) on Complete Substage	11.50
Dimam	4602	*Convertible Lamp*, with 6-v 15-cp. Mazda bulb, Special Condenser and Side Tube Adapter for use with Vertical Illuminator; No. 1789-S	16.00
Acyef	1844-E	*Convertible Lamp* and Mazda bulb, with Lamp Support for oblique illumination of opaque objects; without case	17.00
Acsuc	1844-G	*Convertible Lamp* and 6-volt 15-cp. Mazda bulb, single condenser for producing parallel beam of light on KW Microscope stage; bracket with clamp screw for tilting to desired angle. Including cost of attachment to front of body tube; transformer No. 1847 or resistance No. 1848 necessary to reduce voltage	19.00
Adaft	1713	*Lamp Bracket* with Clamp Screw for tilting to desired angle, including cost of attachment to front of body tube	7.50
Abeyg	1747	*Paraboloid Condenser*, in centering mount, with funnel stop	22.00
Acvaz	1725	*Paraboloid Condenser* No. 1747, and *Convertible Lamp* No. 1844-A; in case without transformer or resistance	35.00
Acveb	1726	Same as 1725, *but including resistance No. 1848*, for use with 6-volt lamp on 110-volt direct or alternating current	41.00
Abesz	1740	*Abbe Condenser* with Iris diaphragm, N. A. 1.20	11.00
Adyol	1844-H	*Convertible Lamp, Nicholas Illuminator* as described, with 6-volt, 15-cp. Mazda bulb, condenser; bracket with 2 joints; lamp cap; centerable bulb socket including cost of attachment to front of body tube; transformer No. 1847 or resistance No. 1848 necessary to reduce voltage	25.00
Acraw	1789-S	*Vertical Illuminator*, with plane glass reflector, full circle, easily adjustable; with condenser and diaphragm	21.50
Acily	1767	*Lamp Support* to hold Convertible Lamp as detached illuminating unit	5.50
Acwec	1847	*Transformer*, for use with 6-volt 15-cp. lamp on 110-volt alternating current	6.00
Acwid	1848	*Resistance*, for use with 6-volt 15-cp. lamp on 110-volt direct or alternating current	6.00
Acvuf	1846	*Mazda Bulb*, 6-volt 15 cp.	*net* .55

*Nicholas Illuminator—This lamp was first made for Dr. J. S. Nicholas, Yale University, Dept. of Zoology.

New B & L Wide-Field Lamp



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Wide-Field Lamp

THIS lamp is the first of its kind for complete illumination of opaque objects upon the stage of a low power binocular microscope. Even though the specimen be deep and cup like with many irregularities, this lamp, by means of its ellipsoidal reflecting surfaces, throws light into every corner and recess, eliminating all shadows.

The Wide-Field Lamp illuminates a very large field, but because of the shape of its reflector the light is all concentrated upon the stage of the microscope and no annoying reflections strike the eyes. Enough light is thrown out at the sides to illuminate a note pad or drawing paper beside the instrument in a dark or semi-darkened room.

This lamp consists of a heavy base and vertical rod upon which the lamp can be adjusted for height. The reflector is pear-shaped with a circular hole at the top through which the specimen is viewed. The light is reflected at all angles into the field of observation.

The lamp is equipped with a 6 volt, 15 candle power bulb. For alternating current a transformer must be used to step down the voltage. On direct current a resistance is required. This resistance can also be used on alternating current.

Code Word	Cat. No.	Specifications	Price
Actib	1813	*Wide-Field Lamp* with stand and 6 v., 15 c.p. bulb	$11.00
Acwec	1847	*Transformer*, for use with 6 v., 15 c.p. lamp on 110 v. A.C.	6.00
Acwid	1848	*Resistance*, for use with 6 v., 15 c.p. lamp on 110 v. D.C. or A.C.	6.00
Acvuf	1846	*Bulb*, 6 v., 15 c.p. *net*	.55

Universal Microscope Lamp

Universal Lamp

HERE is a new addition to the long line of accessories that Bausch & Lomb have provided for use with microscopes. It is called the "Universal Lamp" because it has a universal usefulness in the field of microscope illumination.

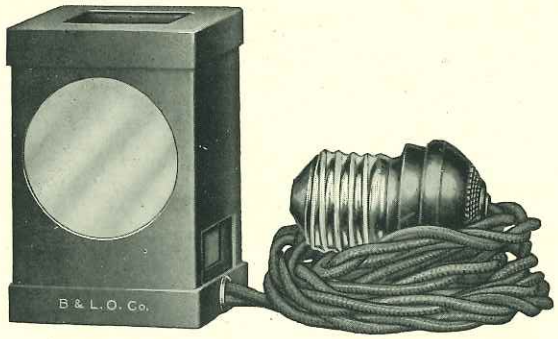
The lamp is provided with a 15-watt, 110-volt, flame-shaped frosted bulb, the diffused rays of which are caught by the microscope's mirror and reflected upwards for illumination of transparent specimens. A reflector concentrates the light rays and directs them toward the mirror. The reflector also serves to shield the microscope stage from disturbing rays of direct light. The arm which carries the bulb and reflector is adjustable, being mounted on the base with flexible metal tube, so that the angle at which the light is thrown may be varied at will. The switch is located on the bulb socket.

The Universal Lamp may also be used for above-the-stage illumination of opaque objects. It can be used to illuminate a note book in a darkened or semi-darkened room. In fact it has a large variety of uses as a general utility lamp.

The lamp can be plugged into any regular lighting outlet. The Universal Microscope Lamp is a very convenient, and very economical, illuminating unit which presents a creditable appearance in any laboratory.

Code Word	Cat. No.	Specifications	Price
Actoc	1808	*Universal Microscope Lamp*, with cord, plug and flexible tube.....*net*	$3.50
Acyuj	1810	*Bulb*, 15-Watt, 110-V., frosted.....*net*	.80

Substage Lamp



Substage Lamp

THE Substage Lamp is of a design which immediately commends itself because of its unusual compactness and efficiency. The complete outfit is placed underneath the microscope stage, the mirror being turned aside so that the lamp sends its rays directly to the specimen. If desired, the lamp can be used equally well in front of the microscope with the light directed to the mirror in the usual way.

The illuminant is a small 15-watt Mazda lamp, 110-115 volts, direct or alternating current, connecting with any house socket. Where only the 220-volt current is available, a small resistance coil is provided at an extra charge. The housing, entirely of metal, has double, ventilated sides and top. A deep-curve reflector fixed behind the lamp bulb intensifies the illumination. Lamp No. 1772 is supplied regularly with one blue glass and one ground glass. Lamp No. 1774 in place of ordinary blue and ground glasses has a ground surface Corning Daylite Glass* window. Each lamp has five and one-half feet of silk-wound cord with plug.

Code Word	Cat. No.	Specifications	Price
Acubr	1772	*Substage Lamp*, with blue and ground glasses, 5½-foot cord and plug	$5.50
Acucs	1774	Same, but with Corning-Daylite Glass in place of blue and ground glasses	6.50
Acufv	1777	*15-watt Lamp*, bulb only *net*	.85

*Gives a light, when used with the Mazda lamp, approximating that received from a white cloud. Renders true colors of stains and specimens, as seen by natural light. Described by Professor Simon H. Gage, in *Science*, October 15, 1915, pages 534-546; also *The Microscope*, by Simon H. Gage, pages 49-62.

Adjustable Microscope Lamp

Adjustable Lamp

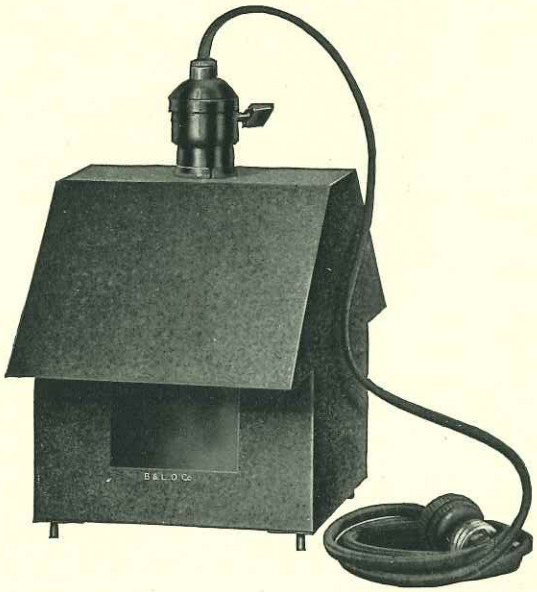
THE housing of this lamp is mounted at the top of a vertical rod adjustable for height, and can be tilted to any desired angle. The condensing lens is focused by a rack and pinion device. There is available, at an extra cost, a Corning Daylite Glass which may be used in front of the condensing lens to secure daylight effects.

The illuminant can be a 100-w Mazda for general work, or a 6-v, 108-w Mazda for dark field illumination, drawing and short range projection. The latter is used on A.C. with a transformer.

For critical illumination Lamp No. 4597 is recommended, equipped with filter holder No. 4563-A, clear Corning Daylite Glass and four neutral tint filters to control the degree of intensity. Price quoted on request.

Code Word	Cat. No.	Specifications	Price
Diakz	4597-C	*Adjustable Microscope Lamp*, with inclination joint, on support adjustable for height; spherical condenser in rack and pinion focusing mount; 100-w Mazda bulb for 110-v D.C. or A.C.	$24.50
Dhipf	4597	Same, but with 6-v, 108-w, coil filament Mazda bulb, and transformer for 110-v, 60 cycle current	35.00
Diesj	4597-R	Same, but with 6-v, 108-w, ribbon filament Mazda bulb	38.50
Dexal	4438	*Resistance* for 110-v D.C., extra	12.00
		Aspheric Condenser (substitute for spherical), extra	7.50
Acyig	2587-S	*100-w Bulb*, gas-filled *net*	2.00
Acuzp	1822	*6-v, 108-w Mazda Bulb*, coil filament *net*	2.50
Aczih	1824	*6-v, 108-w Mazda Bulb*, ribbon filament *net*	6.00
Dialb	4579	*Corning Glass*, with one ground surface, in frame attachable to condenser mount	5.25
Diajy	4563-A	*Ray Filter* and Corning Davlite Glass Holder	2.50

Chalet Microscope Lamp



Chalet Lamp

THIS lamp is made after specifications of Professor Simon H. Gage, Cornell University, and was designed for one or two workers. The illuminant, a 100-watt, gas filled Mazda bulb in metal housing, furnishes a powerful light for all powers. The lamp is equipped with one Corning-Daylite* glass window, 82 mm square, giving an almost pure white light and true color values of stained specimens.

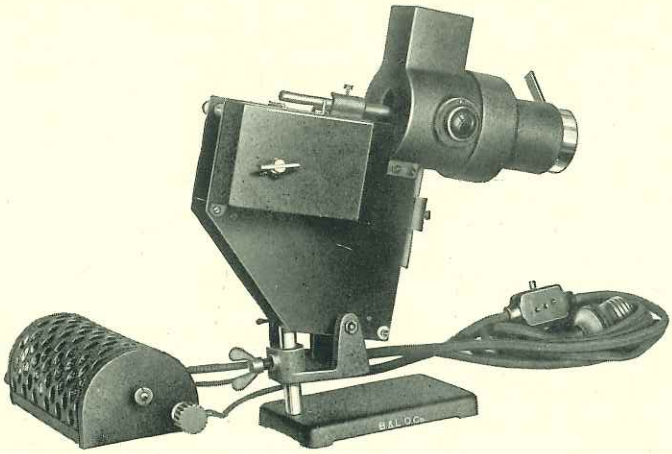
The ventilation is so arranged that sufficient light is allowed to pass through for making notes; however, no direct light reaches the eye. Another opening opposite the one shown in the illustration, when fitted with a window, provides light for a second worker. The housing has no bottom and may be placed over dishes used for heating paraffin, etc.

Code Word	Cat. No.	Specifications	Price
Acugw	1802	*Chalet Lamp*, including one Corning-Daylite glass window, 6-foot cord, switch and plug, for 110-volt circuit	$13.00
Acuhx	1803	Same, but with two Corning-Daylite windows	16.00
Acujy	1804	Same, but with four Corning-Daylite windows	22.00
Aculb	1800	*100-watt Lamp*, bulb only *net*	.50

*See *Science*, October 15, 1915, pages 534-536.

The Microscope, by S. H. Gage, pages 49-52.

Electric Arc Lamp



Mechanical Feed Arc Lamp

THIS electric arc lamp is designed for use with the microscope and may be run from any house circuit socket by interposing a rheostat to regulate the current. It is adapted for all microscope work, including photomicrography and is mounted on a stand with provision for setting at proper height and tilt, as to the mirror. It has a bull's-eye condenser in sliding tube for focusing.

The arc lamp is made in two forms, —with Mechanical Feed or with Hand Feed mechanism. The clock feed mechanism of the Mechanical Feed Arc Lamp operates the carbon holders by means of a constant chain drive and maintains a very steady and uniform arc. Six-inch carbons are used and the carbon holders travel a sufficient distance to consume entire length of carbon with one setting,—giving nearly two hours' steady light.

The lamp may be run on either direct or alternating current, providing correct size of carbons is used, the rheostat shown being for 110 volts, 4.5 amperes. When ordering specify whether for 110-volt or 220-volt circuit.

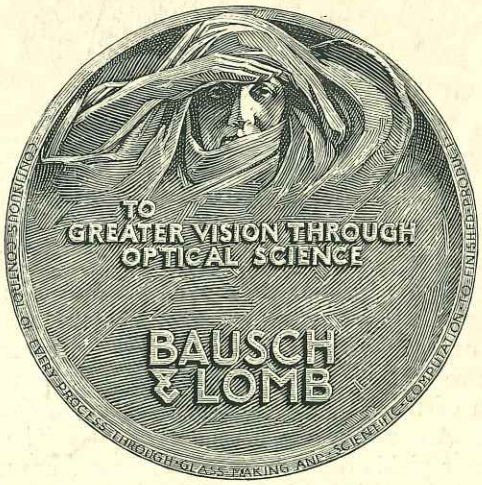
Code Word	Cat. No.	Specifications	Price
Actez	1771	*Mechanical Feed Arc Lamp* (without rheostat) with stable base, inclination joint and condenser	$45.00
Actay	1773	*Hand-Feed Arc Lamp*, including 15-foot cord and plug, but without rheostat	25.00
Detol	4452	*Rheostat*, fixed form, for 110-volts, 4.5 amperes with cord, plug and switch	11.50
Detum	4453	*Rheostat*, fixed form, for 220-volts, 4.5 amperes, with cord, plug and switch	13.50
Dezep	4472	*Cored Carbons*, $\frac{5}{16}$-in. diam., 6 in. long, per ten	.60
Dezir	4473	*Cored Carbons*, $\frac{1}{4}$-in. diam., 6 in. long, per ten	.60

New Research Microscope Lamp

THIS new lamp meets two requirements which few designs satisfy: the one of utilizing the full aperture of the microscope condenser (up to N.A. 1.40) and the other of transmitting sufficient light to make possible critical illumination of the specimen under observation. A specially corrected lamp condenser yields this result and an iris diaphragm placed in front of it provides means for setting to the size of aperture desired. A conveniently placed handle operates the iris and the special condenser is focusable with reference to the lamp filament by a second handle. On the front of the lamp there is a water-cell holder which in turn carries a filter rack with three pockets. To moderate intensity of illumination four neutral-tint filters, graded to reduce the intensity by 10%, 20%, 40% and 80%, are supplied. Also there is included, for white light effect, a Daylite Glass polished on both sides for maximum transmission. The water-cell holder is easily removed when it is desired to clean the condenser lens surfaces. The water-cell is necessary when using Wratten "M" filters for contrast or photography. The Wratten filters or the water-cell are not included unless ordered.

The Mazda lamp used is a 6 volt 108 watt bulb with a tungsten ribbon filament which provides a light source, small in area, of plane surface and even intensity. It is recommended for use on alternating current when available, as it can be used in conjunction with a transformer and connection made to the regular lighting socket. If used on direct current, provision must be made for wiring and a connecting socket of 18 ampere capacity and the lamp used with a resistance.

Code Word	Cat. No.	Specifications	Price
Afawn	1815	*Research Microscope Lamp* with corrected condenser for full-aperture, critical illumination, 6 volt, 108 watt Ribbon filament Mazda bulb and transformer (not shown) for alternating current 110 volts. Four neutral tint filters and one Daylite Glass 50 × 50mm	$67.50
Afaxp	1817	*Water Cell* only	10.00
Aczih	1824	*6 volt, 108 watt Ribbon filament Mazda bulb*	*net* 6.00
		Wratten "M" Filters, price on request.	



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